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EXAMINER
GARBER, CHARLES D

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/072,020	Applicant(s) HENRY ET AL.	
	Examiner Charles Garber	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 3 is/are pending in the application.

4a) Of the above claim(s) *18-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 8-15* is/are rejected.

7)☒ Claim(s) *4,7,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Election/Restrictions

Claims 18-43 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the first sensor head" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim. For purposes of further examination Examiner will simply assume --sensor head-- as had been previously defined in the claims.

Claim 12 recites the limitation "the first circuit board" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. For purposes of further

examination Examiner will simply assume –circuit board-- as had been previously defined in the claims.

Claims 13-14 depending from indefinite claim 12 are indefinite for the same reason.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 6, 9, 12, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Dickey et al. (US Patent 5,821,405).

Regarding claim 1, Dickey discloses a modular water quality apparatus and method including a "wide variety of sensors capable of measuring various water quality parameters" which is equivalent to a sensor head apparatus employable with a multi - parameter monitoring tool assembly. The apparatus includes a sealed or unsealed housing with a cap 12 or sensor head body configured with a plurality of mechanical sensor connections 14 or ports, where each of the plurality of connections is configured to engage and interconnect with sensors 16 or sensor head components. The sensors may be interchanged with updated or different sensors (column 3 line 61 to column 4 line 10). As shown in figure 1 each of the plurality of connections 14 or ports appears sized to receive a sealed connector end 36 of the sensor 16. Engagement and disengagement of the sensor 16 within the plurality connections 14 occurs through

application of a linear motion (depicted by arrows) upon the sensor. Linear force would inherently by required to effect the linear motion depicted.

Regarding claims 5, Dickey further discloses an interchangeable sensor head component comprising at least a sensor though not an accessory (which is defined in the specification as mechanical or electro mechanical components configured for performing a particular task).

As for claim 6, the interchangeable sensors must be either one of active and passive sensors which are defined by the specification as sensor that either have internal power or not. The Dickey sensors must be one of these types as there are logically no other alternatives.

As for claim 9, the sealed housing (no reference number and not shown) discussed above with respect to claim 1 which is attached to the cap 12 (column 3 lines 20-26) is equivalent to an engagement means employable for connecting the sensor head body to at least one other component as in the instant invention.

As for claim 12, figure 1 shown the cap 12 or sensor head body further includes a motherboard 20 or circuit board device attached to it. The motherboard 20 or circuit board device is shown with a plurality of rectangular connection areas for connecting each of a plurality of interchangeable daughterboards 22 which interface with the sensors 16 by sensor connections 18 or 38 (column 4 line 65 to column 5 line 18). The rectangular attachment areas are considered to be equivalent to a plurality of electrical interconnection plugs mounted thereon for providing the interconnection with the interchangeable sensor head components.

As for claim 14, the individual rectangular areas discussed above with respect to claim 12 are considered equivalent to a modular plug-in connection device for electrically connecting with the daughterboards 22 or other circuit card device. Each daughterboard is a separate module.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickey et al. (US Patent 5,821,405) in view of Palfenier et al. (US Patent 6,359,430).

Regarding claim 2, Dickey, as discussed above with respect to claim 17, discloses all the limitations as in the instant invention as well as further disclosing the plurality of connections 14 are each configured to receive and engage a sealed connector 36 of the sensor 16 which is shown in the figures to be an insertable portion of the sensor.

The reference however does not expressly teach the sealing is accomplished with a radially compressible sealing device disposed around the insertable portion.

Palfenier discloses a sensing structure 116 with an end disposed within a sensor housing 102 (see figure 1). Palfenier teaches that "in a preferred embodiment, the connector housing is formed with at least one o-ring groove and an o-ring is disposed within the o-ring groove such that it establishes a seal between the sensor housing and the connector housing." The o-ring shown in the figure is radially compressed in order to effect the seal.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to dispose an o-ring between the end of a sensor and a sensor housing in order to establish a seal and prevent contaminants causing damage to sensitive components.

As for claim 3, Dickey discloses a plurality of connections 14 or ports which are at least first cylindrical portions as shown in the figures. The connections or ports with cylindrical portion is shown exiting through an external surface of the sensor head and includes a first diameter sized to accommodate the connector 36. Dickey however does not expressly disclose a second portion configured to begin a distance below the external surface and includes a second diameter larger than the first diameter, the plurality of ports being further configured such that upon insertion of the insertable portion through the first portion to the second portion, the radially compressive sealing device is configured to expand into the second portion creating a compressive force

which resists withdrawal of the sensor component from the port. In other words, Dickey does not expressly teach a flat bottomed O-ring groove within the sensor port.

Upon close examination of figure 1, Palfenier further shows the outer diameter of the o-ring 138 with a wider diameter than the invisible line defining the inner bore of the housing 106. That is, the inner bore seems to inherently show an indentation to accommodate the wider o-ring. Palfenier though does explicitly provide a cylindrical groove for the o-ring on the sensor side so Examiner considers the apparent slight indentation on the housing side to merely be an artifact of an imprecise illustration.

However, Examiner considers the location of an o-ring groove on either the outer or inner surface of a mating male and female connection to be a substantially equivalent to a rearrangement of parts. It would have been obvious to one having ordinary skill in the art at the time the invention was made to locate the o-ring groove on either the outer or inner surface of the sensor or housing respectively, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Claims 8, 10, 11, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickey et al. (US Patent 5,821,405) in view of DataSonde 4a/Brochure entitled New Series 4a Water Quality Instruments from Hydrolab (henceforth "Hydrolab Brochure")

Regarding claim 8, the Dickey reference as discussed above with respect to claim 5 does not expressly teach an interchangeable sensor head component comprising at least an accessory (which is defined in the specification as mechanical or

electro mechanical components configured for performing a particular task) which is at least one of a wiper device, a shutter device and a stirring device.

The Hydrolab Brochure discloses a similar multi-sensor, multi-parameter water quality sensing device teaching a shuttered turbidity sensor which is an electromechanical device or an accessory as defined in the Applicant's disclosure.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a shuttered turbidity sensor as there is no need to wipe the optical surfaces.

As for claim 15, Dickey lacks the cap or sensor head body further configured to attach to an enclosure device, wherein the enclosure device comprises at least one of: a restrictor, calibration container, and a flow cell.

The Hydrolab Brochure teaches a guard or restrictor attached to the end cap (the end cap is the portion holding probes or sensors) as shown in the photos.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to attach a restrictor to a sensor cap in order to allow water to flow amongst the water sensors while protecting the sensor from impact and damage from any obstacles the device may encounter in the water or while on land.

As for claim 10 and 11, the Hydrolab Brochure teaches the end cap engaging first a housing but also a guard or restrictor. The portion of the cap engaging the housing includes a radially compressive sealing device (not shown but known to the Examiner from personally disassembling one such device) extending around a portion of the cap or sensor head positionable for engaging a portion of the housing as in the

instant invention. The housing is environmentally sealable and encloses sensitive electronic components

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a housing engaging the cap with an o-ring around the cap in order to protect the electronics within from contacting water.

Allowable Subject Matter

Claims 4, 7, 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claim 4, the prior art does not further disclose or suggest the sensor head body further includes at least one atmospheric pathway incorporated therein which interconnects the plurality of the ports so as to distribute atmospheric gasses which may be compressed during engagement and interconnection of the interchangeable sensor head components in any of the plurality of ports.

Regarding claim 7, Dickey as discussed above with respect to claim 6 discloses all the limitations as in the instant invention except for the plurality of connections or ports configured to engage and interconnect with different types of the sensor head components including active sensors, the passive sensors, and the accessories.

The Hydrolab Brochure discloses a similar multi-sensor, multi-parameter water quality sensing device teaching a shuttered turbidity sensor which is an electromechanical device or an accessory as defined in the Applicant's disclosure. Furthermore, the Hydrolab device and sensors are powered by either an external power source or batteries internal to the device (though not specifically internal to the sensors). Therefore the Hydrolab Brochure teaches at least a device having both passive sensors and accessories. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include passive sensors and accessories in order to carry out a plurality of complex sensing tasks with a single device.

However, the reference do not teach the use of active sensors which are defined in the specification as internally rather than externally powered sensors. Though active sensors are widely known their utility is anticipated for sensors that are remotely located from their associated monitoring equipment. The cited references teach individual sensors that are directly connected to their monitoring equipment so one of ordinary skill would not be motivated to include active sensors or individual sensors with their own batteries because the sonde itself has internal batteries which may supply the sensors.

Regarding claim 13, the prior art does not further disclose or suggest the plurality of ports pass from one side of the sensor head body to an opposing side, and the circuit board device is configurable to attach to the opposing side of the sensor head in manner such that the interconnections plugs are positionable in the plurality ports and provide an environmental seal.

Regarding claim 16 the prior art does not further disclose or suggest the enclosure device is connectable to at least one other device which is positionable proximate to the sensor head body.

Claim 17 depending from allowable claim 16 is allowable for the same reason.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The additional references cited on the accompanying form PTO-892 though not cited above are provided to indicate other prior art sensor probes which include one or more features or limitations in common with the instant invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Garber whose telephone number is (703) 308-6062. The examiner can normally be reached on 6:30 a.m. to 3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

cdg